

# Maintenance and Calibration for Respirable Coal Mine Dust Certification Examination

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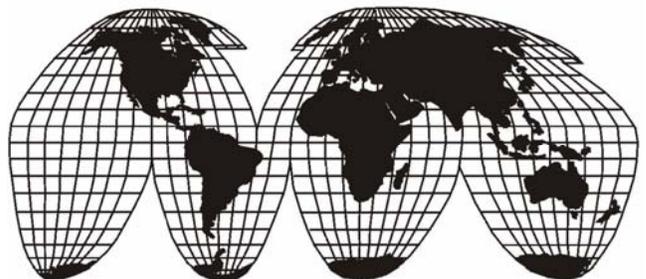


U.S. Department of Labor  
Mine Safety and Health Administration  
National Mine Health and Safety Academy

Instruction Guide Series  
IG 101

2007

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# Certification Maintenance and Calibration for Respirable Coal Mine Dust Examination Question Pool

## I. General Knowledge

1. The purpose of the \_\_\_ is to separate respirable and non-respirable dust.
  - a. vortex finder
  - b. tubing
  - c. grit pot
  - d. nylon cyclone
  
2. The purpose of the filter cassette is to collect the \_\_\_.
  - a. respirable dust
  - b. methane
  - c. non-respirable dust
  - d. moisture
  
3. A \_\_\_ is required on all personal dust samplers to smooth out the flow rate.
  - a. vortex finder
  - b. length of tubing
  - c. 10mm nylon cyclone
  - d. pulsation dampener
  
4. The flow rate of all properly calibrated personal dust samplers is \_\_\_ liters of air per minute.
  - a. 1.7
  - b. 2.0
  - c. 1.9
  - d. 2.5
  
5. The grit pot of a 10mm nylon cyclone of a personal dust sampler traps \_\_\_.
  - a. non-respirable dust
  - b. respirable dust
  - c. methane
  - d. moisture
  
6. The cutoff voltage of a nickel-cadmium battery is \_\_\_ volts per cell.
  - a. 1.0
  - b. 2.0
  - c. 1.3
  - d. 1.2

## II. Pre-sampling Preparation and Sampling Train Assembly

1. Immediately prior to the sampling shift, the voltage of the battery \_\_\_ must be checked with the pump running.
  - a. under actual load
  - b. taken out of the case
  - c. with DC power source attached
  - d. all of the above
2. Sampling head assemblies of personal dust samplers must be cleaned \_\_\_.
  - a. hourly
  - b. monthly
  - c. weekly
  - d. after each use
3. Approved dust sampling devices shall be tested and examined \_\_\_ each sampling shift.
  - a. after
  - b. by MSHA
  - c. immediately before
  - d. none of the above
4. The pre-shift checks of the dust sampling devices must be performed by \_\_\_.
  - a. a Certified Person (Sampling)
  - b. a Certified Person (Maintenance/Calibration)
  - c. MSHA
  - d. either a or b
5. During the pre-shift checks of the MSA Escort ELF<sup>®</sup> personal dust sampler, the battery voltage shall not be less than \_\_\_.
  - a. 6.25 volts
  - b. 3.75 volts
  - c. 4.80 volts
  - d. 6.0 volts
6. Which of the following is **not** included in the report of respirable dust sampling results to the operator?
  - a. The mine identification number
  - b. The concentration of respirable dust expressed in mg/m<sup>3</sup>
  - c. The reason for voiding any samples
  - d. none of the above

7. Testing and examinations of pumps and sampling assemblies immediately prior to the shift of use must be performed \_\_\_\_\_.
  - a. within 1 hour of the beginning of sampling
  - b. within 2 hours of the beginning of sampling
  - c. within 3 hours of the beginning of sampling
  - d. within 24 hours of the beginning of sampling

### III. Calibration

1. The wet test meter must be \_\_\_\_.
  - a. at a 90° angle
  - b. in a level position
  - c. at a 45° angle
  - d. none of the above
  
2. When calibrating a personal dust sampler with a 1 liter, soap-film calibrator, it is necessary to record the average time of \_\_\_\_ readings.
  - a. 2
  - b. 4
  - c. 5
  - d. 6
  
3. When calibrating a personal dust sampler with a wet test meter, it is necessary to record the time of \_\_\_\_ complete revolutions.
  - a. 5
  - b. 3
  - c. 1
  - d. 2
  
4. The water manometer should indicate at least \_\_\_\_ inch(es) of water pressure differential for all personal dust sampling devices.
  - a. 0.5
  - b. 1.0
  - c. 3.0
  - d. 4.0
  
5. Before calibrating, the inside of the soap-film calibrator should be coated with \_\_\_\_\_.
  - a. clear water
  - b. soap film
  - c. oil to make the soap slide easily
  - d. none of the above
  
6. The cutoff voltage of a nickel-cadmium battery is \_\_\_\_ volts per cell.
  - a. 1.0
  - b. 2.0
  - c. 1.3
  - d. 1.2

7. The battery voltage of the Escort ELF<sup>®</sup> personal dust sampler under actual load must be at least \_\_\_\_ volts times the number of nickel-cadmium cells in the battery pack. (Escort ELF<sup>®</sup>)
  - a. 1.2
  - b. 1.0
  - c. 1.25
  - d. 2.35
  
8. All personal dust samplers must be calibrated every \_\_\_\_ operational hours.
  - a. 160
  - b. 200
  - c. 240
  - d. 320
  
9. During calibration of any personal dust sampling device, a low reading on the water manometer would indicate \_\_\_\_.
  - a. high barometer
  - b. high voltage peak
  - c. system air leak
  - d. excessive air flow
  
10. The water manometer should indicate less than \_\_\_\_ inch(es) of water pressure differential for all personal dust sampling devices.
  - a. 0.5
  - b. 1.0
  - c. 3.0
  - d. 2.0
  
11. A \_\_\_\_ shall calibrate and maintain respirable dust sampling equipment.
  - a. a person directed by a Certified Person
  - b. Certified Person (Sampling)
  - c. Certified Person (Maintenance/Calibration)
  - d. state enforcement agency
  
12. To become a Certified Person Maintenance and Calibration, the applicant must \_\_\_\_.
  - a. petition the state
  - b. pass an exam conducted by MSHA
  - c. attend a course given by the state
  - d. also be certified for sampling
  
13. Coal mine dust personal sampling units shall be calibrated in accordance with \_\_\_\_.
  - a. NIST
  - b. state regulations
  - c. Informational Report No. 1240
  - d. company policy

14. MSHA will accept the use of a fast response calibrator for calibrating respirable dust pumps if they meet what requirements? \_\_\_
  - a. have an LCD
  - b. average repetitive runs
  - c. have a volumetric tube traceable back to the National Institute of Standards and Technology
  - d. MSHA does not accept fast response calibrators
  
15. When calibrating any respirable dust sampler, the flow rate shall be 2.0 LPM plus or minus \_\_\_\_.
  - a. 0.1 LPM
  - b. 0.2 LPM
  - c. 0.4 LPM
  - d. 0.3 LPM
  
16. When calibrating a personal dust sampler with an approved fast response calibrator it is necessary to obtain and average the results of \_\_\_\_ readings.
  - a. 1
  - b. 3
  - c. 5
  - d. 7
  
17. To be considered suitable for compliance sampling, the respirable dust pump must be properly calibrated and the appropriate approval labels must be affixed to the exterior of the pump.
  - a. True
  - b. False

## IV. Maintenance

1. The \_\_\_ of the cyclone should be examined for scoring.
  - a. inner surface
  - b. outer surface
  - c. grit pot
  - d. none of the above
2. If an attempt is made to charge a battery with less than \_\_\_ volts per cell, cell polarity may reverse.
  - a. 2.0
  - b. 1.0
  - c. 1.25
  - d. 1.2
3. During calibration of any personal dust sampling device, a high reading on the water manometer would indicate \_\_\_\_\_.
  - a. system obstruction
  - b. excessive air flow
  - c. low barometer
  - d. either a or b
4. Scratches or cuts on the inside of the sampling head's nylon cyclone are called\_\_\_\_\_.
  - a. scoring
  - b. bruising
  - c. scratches
  - d. marking
5. There are \_\_\_ nickel-cadmium cells in the battery pack of the MSA Escort ELF<sup>®</sup> personal dust sampler.
  - a. 3
  - b. 4
  - c. 5
  - d. 6
6. A \_\_\_ shall calibrate and maintain respirable dust sampling equipment.
  - a. a person directed by a Certified Person
  - b. Certified Person (Sampling)
  - c. Certified Person (Maintenance/Calibration)
  - d. state enforcement agency

7. It is acceptable to repair respirable dust pumps and battery packs with parts equivalent to those provided by the manufacturer.
  - a. True
  - b. False

## Answers

### Section I

1. D
2. A
3. D
4. B
5. A
6. A

### Section II

1. A
2. D
3. C
4. D
5. C
6. D
7. C

### Section III

1. B
2. A
3. B
4. B
5. B

### Section III (Continued)

6. A
7. A
8. B
9. C
10. C
11. C
12. B
13. C
14. C
15. A
16. B
17. A

### Section IV

1. A
2. B
3. D
4. A
5. B
6. C
7. B

